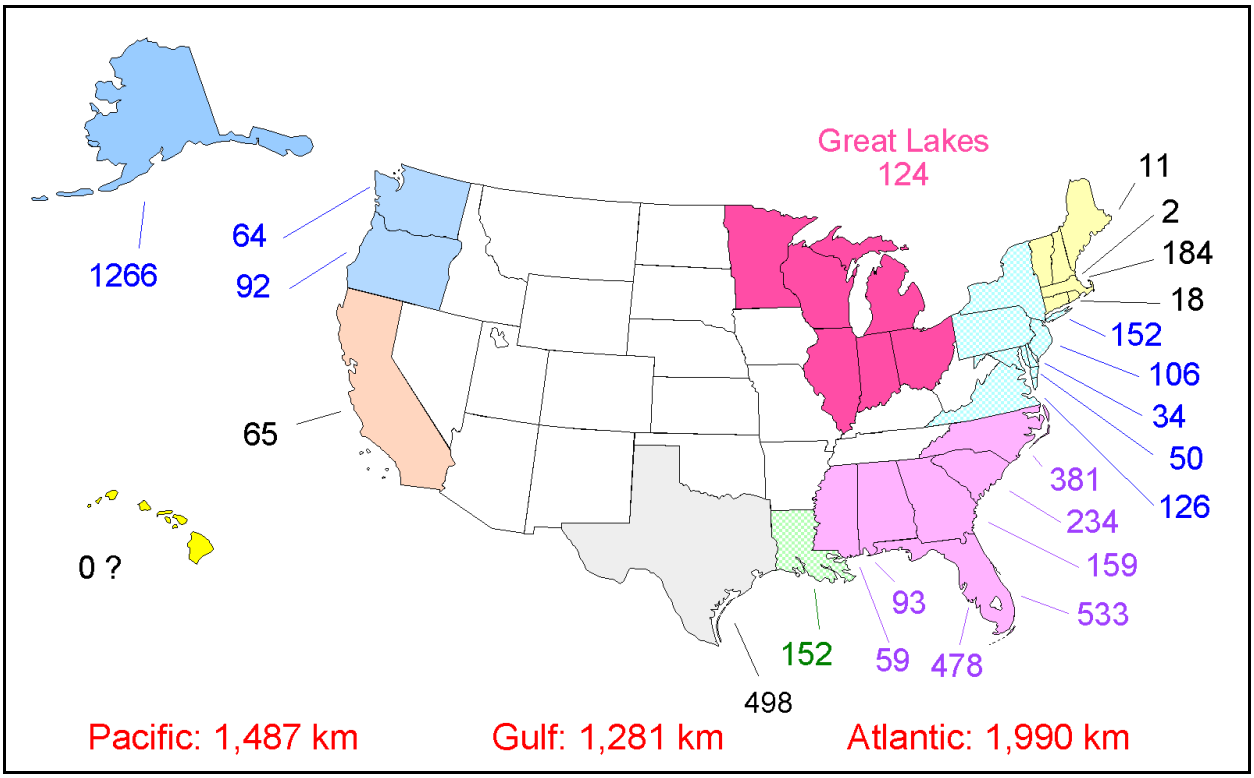

Figure I-2-5. Length (in km) of barrier islands and spits in the United States. Data measured from U.S. Geological Survey topographic maps (see Table IV-2-3 for details)

d. Gulf of Mexico East: Wetland mangrove, and barrier coasts (Figures I-2-8, I-2-9). On Florida's Gulf of Mexico coast, barrier islands begin at Cape Romano and extend north as far as Cedar Keys. Enclosed bays usually have an abundance of mangrove islands and the topography is low with many lakes and marshes. North of Cedar Keys, the barrier islands end. They are replaced by a vast marsh doted with small vegetated islands. The rock strata in this area are limestone, which, along with the low river gradients and numerous ponds or sinkholes, accounts for the absence of sand in the region. Due to its location and the large shallow water area offshore, little wave energy is present except during rare hurricanes. Some 130 km to the northwest, the swamp coast ends. Here the coastal trend changes direction from north-south to east-west, and Ochlockonee Bay, with drainage from the southern Appalachian Mountains, provides quartz sand for redevelopment of barrier islands. These sandy islands, with their various openings for access to the lowland port cities, continue westward as far as the Mississippi River delta (Figures I-2-10 and I-2-11).

Studies of the Mississippi delta indicate that the river has built a series of deltas into the Gulf of Mexico during postglacial times and that the Balize Delta (bird foot) is the latest, with an age of about 1500 years. The Bird Foot delta is southeast of New Orleans, lying among a series of old passes that extend for 300 km (186 miles) along the coast. Most of the greater Mississippi delta is marshland and mud flats, with numerous shallow lakes and intertwining channels (Figures I-2-12 and IV-3-9). The principal rivers have built natural levees along their course. These natural levees are about a meter above the normal water level, but many of them have been artificially raised to provide protection to towns and cities from floods. Aquatic plants cover the marshland, which is remarkable for the huge population of waterfowl it supports. In the areas of old delta lobes, subsidence has left only the natural levees above water in some instances.

e. Gulf of Mexico West: Barrier coast. From western Louisiana, west of the Mississippi Delta marsh coast, toward the southwest, barrier islands become the dominant coastal features. Some of the longest

Figure I-2-6. Cape Hatteras, North Carolina, view north. The Atlantic Ocean is to the right, and the bay to the left of the barrier is Pamlico Sound. The rough water in the foreground is the infamous Diamond Shoals, known as the "Graveyard of the Atlantic." The bump in the shoreline is the location of the Cape Hatteras lighthouse, which was recently moved inland away from the receding shore. A mature maritime forest has grown on the beach ridges in the central portion of the barrier. The forest indicates that this portion of the island has been stable for several hundred years. Photograph taken February 28, 1993, during the waning stage of an extratropical storm

barrier islands in the world are located along the Texas coast. Padre Island and Mustang Island, combined, extend for 208 km and feature extensive dune fields behind the broad beaches. The dunes rarely rise more than 10 m in height, and many marshy wash-over deltas have extended into the large lagoons behind the barriers. The lagoons and estuaries decrease in depth toward Mexico. A large part of Laguna Madre is only inundated during flood periods or when the wind blows water from Corpus Christi Bay onto the flats. River deltas are responsible for much of this infilling, resulting in large differences between recent chart depths and those of 100 years ago (Shepard 1982).

f. Pacific: Sea cliffs and terraced coasts (Figures I-2-13, I-2-14). Low sea cliffs bordered by terraces and a few coastal plains and deltas compose the coasts of southern California. Blocks form projections into the sea and feature a series of raised terraces such as those at Point Loma, Soledad Mountain, and the San Pedro Hills in the Los Angeles area. North of Los Angeles, the Santa Monica Mountains follow the coast. Sea cliffs in this area are actively eroding, particularly in areas where they have been cut into alluvium (Figure I-2-15). At Point Conception, the coast trends north-northwest and a different